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Chronic maxillary sinusitis associated with dental impression material

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Abstract

A 62-year-old man was referred for routine treatment of hyperplasia of the mucosa in the anterior lower jaw. An oroantral fistula was detected in the right superior alveolar ridge. The patient had no complaints. Plain radiographs showed a radiopaque foreign body in the posterior region associated with opacification of the maxillary sinus. Computed tomography showed the same hyperdense foreign body located in the posterior lower part of the sinus and an abnormal soft tissue mass in the entire right maxillary sinus. When asked about sinusitis, the patient mentioned occasional episodes of pus taste and intermittent crises of headache lasting for one week. The patient has been edentulous for 20 years. Sinus debridement was performed and the oroantral fistula was closed. The clinical suspicion of the presence of zinc oxide-eugenol paste was confirmed by microscopical and chemical analysis. After 6 months of follow-up, the fistula continued to be closed and sinusitis did not recur. This clinical case of maxillary chronic sinusitis illustrates a different odontogenic origin.

Key words: Maxillary chronic sinusitis, zinc oxide-eugenol paste, antroliths.

Introduction

The maxillary sinus is covered with ciliated pseudostriated columnar epithelium essential to secretion of mucous to ostium. Its function depends on the ostium opening, cilium apparatus and secretion quality. The interruption of this balance causes sinusitis.

Primary membrane inflammation was believed for a long time to be the cause of the sinusitis, but recently literature (1,2) have demonstrated that a blockage that interrupts the normal drainage is its real cause.

Acute sinusitis when not treated could become chronic, defined as recurrent episodes for more than 3 months.

One of the causes of chronic sinusitis are antroliths, defined as calcified bodies resulting from the deposition of mineral salt around a nucleus within the antral cavity (1-3). Antroliths can be classified into endogenous and exogenous antroliths. Endogenous antroliths may form around blood, mucus, pus, red blood cells, or white blood cells. Exogenous antroliths may develop around a foreign body such as a tooth, tooth root, bead, button, paper, vegetable/bean pieces, snuff, and fruit seeds (3). Foreign bodies in the maxillary sinus or antroliths may also arise from dental practice. For example, there are reports of root canal overfilling to the maxillary sinus causing chronic sinusitis (4).

In this paper, we report an interesting case of chronic maxillary sinusitis caused by dental impression material in an adult male patient.

Case Report

A 62-year-old male patient was referred for routine treatment of mucosal hyperplasia in the anterior lower jaw. The patient did not report any clinical symptoms and his medical and family histories were not contributive.

Local inspection revealed a small spot in the posterior right superior alveolar ridge, suggestive of an oroantral fistula. When asked, the patient mentioned occasional episodes of pus taste and intermittent crises of headache lasting for one week. The patient has been edentulous for 20 years.

Gutta-percha probing confirmed the fistula, and panoramic and paranasal sinus radiographs revealed the presence of a radiopaque foreign body in the posterior region associated with opacification of the right maxillary sinus (Fig.1). Computed tomography showed thickening of the mucosal lining and the presence of a hyperdense foreign body located in the posterior lower part of the sinus and an abnormal soft tissue mass in the entire right maxillary sinus. These images were compatible with antrolith and chronic sinusitis. The other paranasal images were normal (Fig.2).

The sinus was accessed through the oroantral fistula under local anesthesia. The hypertrophic mucosal lining of the sinus, as well as the foreign body located next to



Fig. 1. Radiopaque foreign body in the posterior region of the right maxilla.

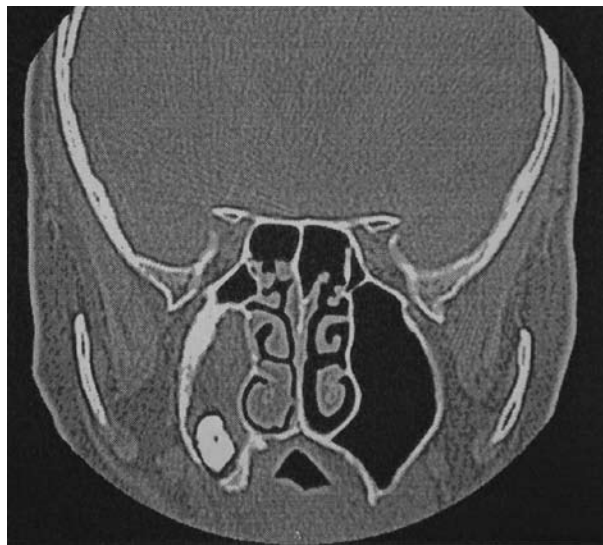


Fig. 2. Coronal computed tomography scan showing a hyperdense foreign body and opacification of the right maxillary sinus.

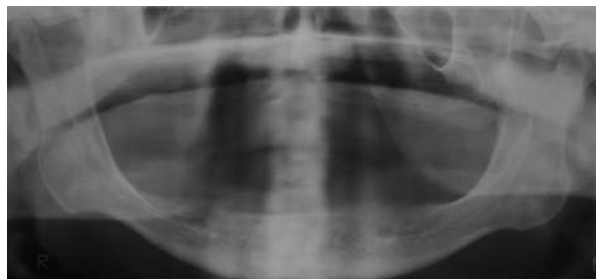


Fig. 3. Six-month follow-up radiograph.

the fistula were removed. The foreign body measured 15 mm x 10 mm, had an oval shape and was grey in color. The oroantral fistula was closed with a buccal fat pad flap with interrupted sutures. Antibiotics and nonsteroidal anti-inflammatory drugs were prescribed before and after surgical treatment.

Microscopic examination of the sinus mucous membrane revealed chronic inflammation, with signs of acute exacerbation. Analysis of the foreign body showed a nonspecific inorganic product. There were no signs suggesting the presence of specific infection.

Since the patient had been submitted to prosthetic rehabilitation in the past, it was suspected that the foreign body resulted from the extravasation of impression material through the oroantral fistula. Chemical analysis comparing the foreign body to a zinc oxide-eugenol paste by atomic absorption spectrometry (Varian FS-240 spectrometer, Melbourne, Australia) confirmed the initial suspicion.

After 6 months of follow-up, the patient was healthy and no recurrence was observed (Fig.3).

Discussion

Antroliths are calcified bodies resulting from the deposition of mineral salt around a nucleus within the antral cavity and are one of the causes of chronic sinusitis (1-3). In the literature these calcareous masses have been described as rhinoliths (inside the nasal passages), maxillary sinus stones, antral calculi, antral stones, antral rhinoliths, antroliths, and sinoliths.

Antroliths can be classified into endogenous and exogenous antroliths. Endogenous antroliths are considered to be true lesions and may form around blood, mucus, pus, red blood cells, or white blood cells. Exogenous antroliths are defined as false lesions and may develop around a foreign body such as a tooth, tooth root, bead, button, paper, vegetable/bean pieces, snuff, and fruit seeds (3). However, some authors tend to include teeth or tooth roots among the endogenous causes of antroliths (3). Although the pathogenesis of antroliths is not completely understood, long-term infection, poor sinus drainage and the presence of a foreign body have been suggested as major causes (1).

Another cause for antroliths and rhinoliths is the accumulation of calcium salts in fungal masses (4). This is common in aspergillus sinusitis and is radiologically characterized by hyperdense lesions resembling foreign bodies (5). Conditions that favor fungal infections are diabetes, long-term treatments (antibiotics and corticosteroids), radio- and chemotherapy, immunosuppressive treatment, and immunodeficiency diseases (5). Several investigators have suggested that mycotic infections of the paranasal cavities are more commonly found in apparently healthy patients. In Europe, the most frequent microorganism involved is *Aspergillus fumigatus* (5,6).

According to the literature, foreign bodies in the maxillary sinus may also arise from dental practice (7). For example, there are reports of root canal overfilling to the maxillary sinus causing sinusitis (8). After tooth extraction, an oroantral fistula cannot be immediately detected if the Valsalva test (9) is not performed. After healing, the oroantral fistula is small and is undetectable during the impression procedures. Zinc oxide-eugenol paste passes through the fistula in its plastic form and after curing becomes a foreign body inside the maxillary sinus. The diagnosis is only made when the patient presents the clinical symptoms of sinusitis.

Although there are no reports of impression material passing through the oroantral communication and causing chronic sinusitis, our microscopic findings are similar to the literature showing chronic inflammation around inorganic content.

Panoramic radiography is the predominant method for the diagnosis of antroliths, mainly in asymptomatic cases (3). Antroliths are observed as radiopaque lesions of various sizes and shapes within the maxillary sinus antrum. In this respect, the differential diagnosis of antroliths should include displaced or ectopic tooth fragments, calcified mucus retention cysts, bone cysts, fungal infection with secondary calcification, displaced follicular cysts, condensing osteitis, rhinoliths, calcified polyps, mycoliths, odontomas, osteomas, cementomas, fibrous osseous lesions, metastatic carcinoma, osteogenic sarcoma, calcifying epithelial odontogenic tumor, and foreign bodies.

When antroliths are asymptomatic, surgical intervention is not required, but patient follow-up is of fundamental importance. In contrast, when infection is installed, signs of facial pain, nasal stiffness and obstruction, purulent or blood-stained foul-smelling discharge, and epistaxis might be observed. In the presence of these signs and symptoms, surgical intervention is indicated for sinus debridement.

Iatrogenic causes of antroliths are not uncommon, for example, extravasation of endodontic sealers to the maxillary sinus during root canal obturation (4). On the other hand, the history of tooth extraction is important. Nass Duce et al, in 2003, (1) found that 16 (61.5%) of 28 cases with antrolithiasis had a history of tooth extraction performed between three months to 21 years earlier. This finding suggests the potential role of dental procedures in the etiology of antrolith formation and explains, in part, the chronic sinusitis of the present patient.

Case reports of antroliths caused by dental impression materials are rare. Nevertheless, this case is important due to the wide use of zinc oxide-eugenol paste, especially during impression procedures for prosthetic rehabilitation, after tooth extraction. It is also an opportunity to emphasize the importance of the Valsalva test (9) for

the immediate diagnosis and treatment of an oroantral communication. We believe that many cases reported as foreign body antroliths were published without identifying the true nature of the removed material. This fact explains the few reports on this subject.

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